

# 2022

## Corporate Responsibility Update

Arla Foods Ingredients



**Arla Foods Ingredients**  
Discovering the wonders of whey 

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# BUILDING SUSTAINABLE RESILIENCE IN THE FACE OF CHALLENGE



A critical test of any business with an ambitious strategy for sustainable growth is how it handles an unexpected challenge. In 2022, that challenge appeared on 24 February when Russia invaded Ukraine – the beginning of great suffering for the Ukrainian people and the catalyst for a global energy crisis and surging inflation.

For us at Arla Foods Ingredients, the uncertain situation regarding energy supplies led us – along with many other production companies – to make provisions for keeping operations running in the event of a shortage. In Denmark, this involved preparing our two large processing plants to run either on natural gas or fuel oil. This flexibility is now in place.

## Unchanged commitment

Such a measure, however temporary, is an inevitable setback with regard to our 2030 carbon reduction goals. But it has not changed our commitment. During 2022, we launched a new roadmap towards sustainable operations, which redoubles our efforts to stay on target despite the challenges we face. As we enter 2023, our top priority from an energy perspective is to continue the transition from fossil fuels to renewable energy sources.

Major investments are underway to achieve this, including the initial steps to electrify more of our processes and investigations to identify new sources of carbon-neutral energy.

## Reduce, reuse, recycle

Another of our priorities is to integrate circular bioeconomy principles in our growing business – a logical extension, you could say, of our founding vision to utilise the whey ‘waste’ from cheese processing. This requires us to consider how we can reduce, reuse and recycle each of the resources we employ in our operations.

To limit our energy consumption, some of our most recent initiatives have focused on capturing and repurposing surplus heat in production. We are also looking at further investments to reduce our reliance on well water. Plans are already moving ahead to double the capacity of our new technical water

facility, which upgrades treated wastewater to a quality suitable for reuse in technical applications.

In addition to these efforts, we are naturally concerned with making the best use of the raw materials that go into our products and packaging. During 2022, we completed the task of mapping how much of our powder products ends up as food waste, and we made more progress towards our goal of fully circular own-brand packaging by 2030. Both areas will be the subject of continuing investigation and improvement in 2023.

## Collaborations for health and wellbeing

Our sustainability roadmap is not just about contributing to the health of the planet. The health and wellbeing of the people that live on it are at the core of our work within lifelong and affordable nutrition. This is where strategic partnerships with research institutes, NGOs and other companies can make a real difference.

As you can read on the following pages, our collaborative clinical studies are exploring the potential nutritional benefits of milk and whey ingredients for infants, the elderly and those with diet-related health conditions. Over the past ten years, our affordable nutrition partnerships have produced a series of sustainable food supply chain models to help alleviate malnutrition in countries where childhood stunting is rife.

## A responsible mindset

Across our organisation, initiatives to secure diversity and inclusion, empowerment and, above all, safety for colleagues are part of the effort to instil a responsible mindset in everything we do.

There’s still much to be done. In 2022, our roadmap towards sustainable operations defined our direction. Planet, people and partnerships are the three pillars that will guide us towards our goals through 2023 and beyond.

**Henrik Andersen**  
CEO

# ABOUT ARLA FOODS INGREDIENTS

Arla Foods Ingredients is a global dairy-based ingredients company and 100% owned subsidiary of Arla Foods. We sell our ingredients to food manufacturers in more than 100 countries.

## Results 2022

Our net revenue totalled EUR 1,047 million in 2022, which is a 25% increase compared to 2021. More information about our financial performance is available in the Arla Foods annual report.

## Market development

Arla Foods Ingredients is one of the world's leading producers of milk and whey-based ingredients, targeting early life, sports and medical nutrition, health foods for specific consumer groups and functional solutions for bakery and dairy products.

We have built our business around our ability to discover and deliver components in milk and whey that can bring value to the food industry. Our goal is to utilise our raw materials to their highest potential.

## Production sites

Our flagship whey processing facility is Danmark Protein, located in West Jutland, Denmark. This is where we produce the most specialised whey-based ingredients in our portfolio and the highest volumes overall. Our third-party manufacturing facility and second largest site ARINCO is located nearby.

Arla Foods Ingredients owns and operates the AFISA plant in Argentina. Our joint venture facilities include ArNoCo in Germany and MVI in the UK.

## Overview of production sites:

### *Danmark Protein, Denmark*

Advanced whey protein processing facility, including dedicated plants for hydrolysate and dry-blend lactose production

### *ARINCO, Denmark*

Third-party manufacturer of products for child nutrition and milk powder

### *AFISA, Argentina*

Leading whey processor in MercoSur, producing whey proteins and permeate

### *ArNoCo, Germany*

Joint venture with DMK Deutsches Milchkontor, producing whey protein concentrate for further processing at Danmark Protein and lactose

### *MVI, UK*

Joint venture with Volac, producing whey protein concentrate and permeate powder



# A NEW ROADMAP FOR SUSTAINABILITY IN OUR BUSINESS

At Arla Foods Ingredients, we share the same overall sustainability ambitions as our parent company, Arla Foods. However, the nature of our business sometimes requires an adapted approach to achieve them. In 2022, we launched a new roadmap for achieving our sustainability goals as we grow our business and for delivering into the sustainability commitments of the Arla FUTURE26 strategy.

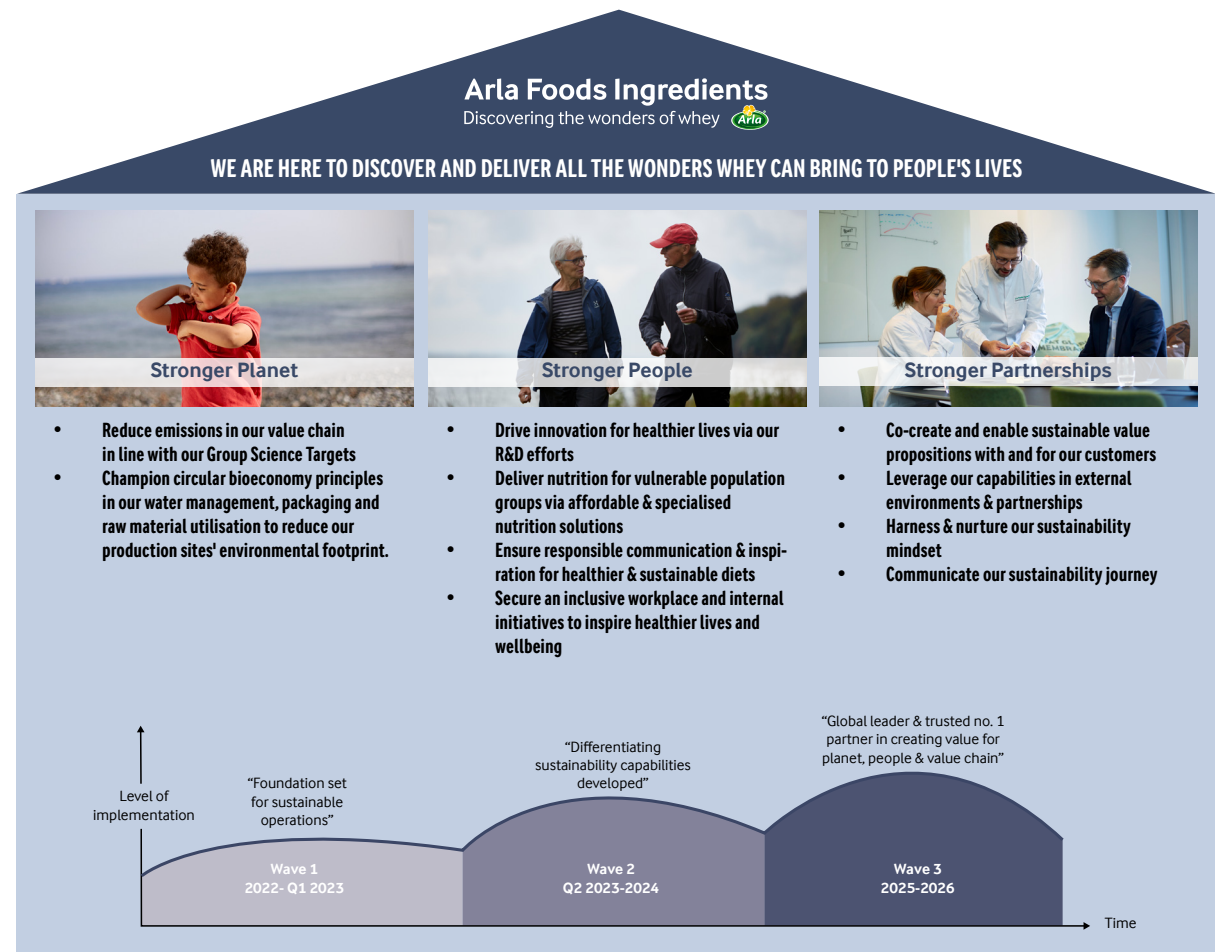
The roadmap builds on three pillars. Two of them – Stronger Planet and Stronger People – have been central to our corporate responsibility reporting for a number of years. The third and new pillar is Stronger Partnerships, which runs across the activities of the other pillars. Here, the emphasis is on co-creation of sustainable value propositions with customers; capability and knowledge-sharing through external partnerships; and the nurturing of our sustainability mindset. Reporting on Stronger Partnerships will be integrated in the Stronger Planet and Stronger People chapters of this update.

Scheduled to run until the end of March 2023, the roadmap’s first wave broadly concentrates on establishing the foundation for sustainability excellence in our organisation – by evaluating how far we have come on our sustainability journey and where we want to go. Our sustainability ‘house’ outlines the core focus areas of each pillar.

## Our contribution to the global goals

The 17 UN Sustainable Development Goals (SDGs) are a source of inspiration, setting the direction for the continuous improvement of our operations and long-term growth of our business. During 2022, we took a fresh look at where we believe our company can make a meaningful contribution to the SDGs. On that basis, this update will highlight activities in relation to the eight goals below.

Over the past year, we have also begun mapping our impact in relation to the SDGs, using the business indicators set out in the SDG Compass. Although this work is still at an early stage, we expect it to provide fresh insights that will strengthen future waves of our sustainability roadmap.





# STRONGER PLANET

We recognise our responsibility to minimise our environmental footprint. Through 2022, we have focused on the three Rs – reduce, recycle and reuse – and our gradual transition to carbon-neutral energy

# PREPARING OUR PLANTS FOR SUSTAINABLE GROWTH

The Stronger Planet pillar of our sustainability roadmap highlights two key priorities for becoming a sustainable growth company. One is the adoption of circular bioeconomy principles to ensure we continue to reduce, reuse and recycle resources at our production sites. The other is to replace fossil fuels with renewable energy sources as a means to achieving the Arla Science-Based Targets for scope 1 and 2 emissions.

We have a good starting point for both objectives. On the one hand, our business has circular origins, rooted in our primary raw material – the whey side-stream of cheese

processing. On the other, we are already committed to our group-level target to use 100% renewable electricity by 2025 in our European operations. The use of biogas at our Danish production sites further reduces our reliance on natural gas.

Over the past years, we have worked continuously to optimise our use of resources. In line with EU law, our plants are also required to document their use of the best available techniques for protecting the environment from all types of emission.

Nevertheless, there is still much to be done. To target our efforts, in 2021 we established four workstreams for energy, water, packaging and food waste.

On the following pages, you can read about the primary initiatives and challenges within each workstream during 2022. Detailed performance figures are available in the Ambitions & Progress Data chapter.



## Science-based targets for climate action

Our group-level absolute reduction target for scope 1 and 2 emissions is 63% by 2030, against a 2015 baseline. In 2021, the Science-Based Targets Initiative (SBTi) approved the target as consistent with the Paris Agreement ambition to limit global warming to 1.5°C. Arla Foods Ingredients will deliver into the target by driving the green transformation at the three fully-owned production sites.

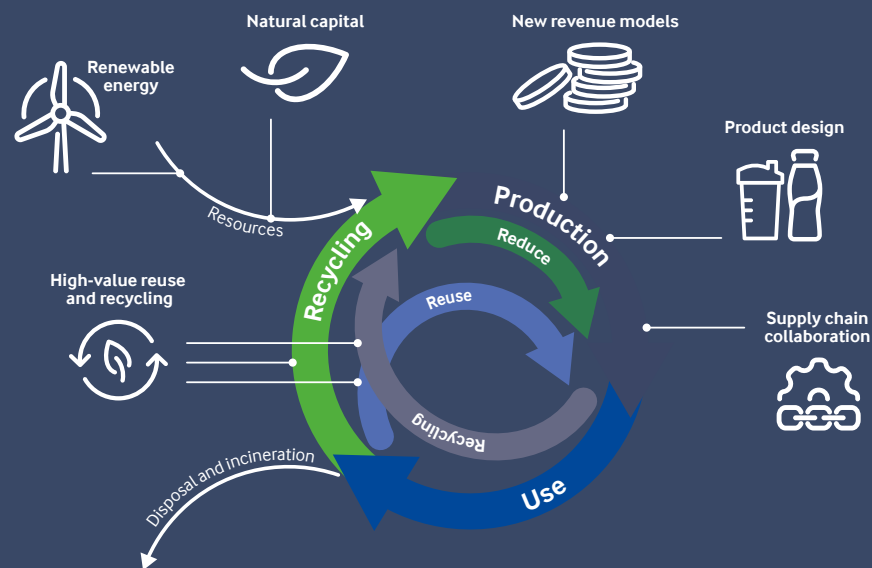
With regard to scope 3 emissions, our group-level target of a 30% reduction by 2030 is under revision following the publication of new SBTi guidelines for Forest, Land and Agriculture (FLAG) in late 2022. During 2023, we will participate in a global Arla project to achieve the updated scope 3 target for land-based emissions, in line with the FLAG guidelines.

## Our circular bioeconomy vision

Our vision for a circular bioeconomy at Arla Foods Ingredients is about moving from the linear model of take, make and dispose to the circular model of reduce, reuse and recycle. The goal is to work towards a resilient system that increasingly decouples business from the consumption of limited resources, benefiting the planet, people and profits.

In practice, we aim to:

- create maximum value from all components in our whey and milk raw materials
- reduce our energy consumption by recycling and redistributing surplus heat
- minimise use of well water by reusing water extracted from raw materials and recycling wastewater
- partner with suppliers to optimise packaging and eliminate fossil-based virgin plastic
- eliminate waste for disposal and incineration



# ENERGY

2022 was a challenging year from an energy perspective. Electrification and energy reuse are key to meeting our carbon reduction goals.

## Securing our energy supply

The global energy crisis added an extra dimension to our energy optimisation and decarbonisation plans at our production sites in 2022. In addition to investigating new initiatives and investments to meet our carbon reduction goals, we found ourselves in the position of having to secure sufficient energy supplies to keep our production running.

Due to the risk of a natural gas shortage, it was necessary to prepare our Danmark Protein and ARINCO plants for running on fuel oil. Consequently, the production lines at Danmark Protein switched partially to fuel oil in the fourth quarter of the year, with biogas covering 39% of total gas needs through 2022. ARINCO continues to use a combination of natural gas and biogas for the time being – using 44% biogas this year. The transition to fuel oil is a temporary measure until the energy crisis subsides.

Despite this setback in our journey towards renewable energy, we remain committed to reducing our scope 1 and 2 carbon emissions by 42% in 2030 compared to 2015. This is our contribution to the group-level reduction goal of 63% and accounts for considerable production growth in the coming years. We have a close collaboration with our parent company to achieve this ambition.

## Reorganisation under Greenify

During 2022, we reorganised our energy workstream under a new heading – Greenify – covering our three fully-owned production sites, supply chain development, research & development and reporting & tracking.

Creating data transparency has been a priority this year, as we have worked to establish a company-wide overview

of ongoing energy projects and the ensuing impact on carbon emissions. Availability of reliable data gives us the basis for comparing and prioritising energy initiatives and better sharing of knowledge and experience between sites.

Through our collaboration with Arla, we are now working with supplier-driven assessments as part of a multi-site continuous improvement programme. Rollout of LED lighting, steam valve insulation and pump replacement are the three energy-saving focus areas we have worked with in 2022. New focus areas have been identified for 2023.

Our carbon reduction goals mean energy considerations are increasingly integrated in all other continuous improvement initiatives at our sites, such as this year's installation of a new water treatment unit for ice water at ARINCO.

In 2023, we aim to develop a sustainability programme for each of our sites. This will support our roadmap towards decarbonisation and the development of a capital investment plan for transforming the energy management system. Site workshops and energy mapping assessments will be run to identify further initiatives.

## The move to electrification

The transition away from fossil-based fuels necessitates the electrification of our production processes. As industrial heat pump technology matures, we are now investigating the possibility to integrate heat pumps in our heating and cooling systems at Danmark Protein – a complex project that requires significant investment.

In 2022, we have focused on designing the specifications for using heat pumps to produce both 90°C hot water and ice water. This work will continue through 2023, with implementation planned for 2024. The expectation is the heat pumps will then cover 11% of the site's energy needs, running on green power supplied through a group-level power purchase agreement.

Looking ahead, the emergence of new power-to-x technology will support the use of electricity for a wider range of needs. In preparation, Danmark Protein will be the first site in the Arla group to instal a 15MW electric boiler in 2023. Located alongside the existing gas-fired boilers, the electric boiler will be able to switch between electricity and gas. The technology will be adapted for use at other Arla plants following an evaluation of results.

## Heat recovery and reuse

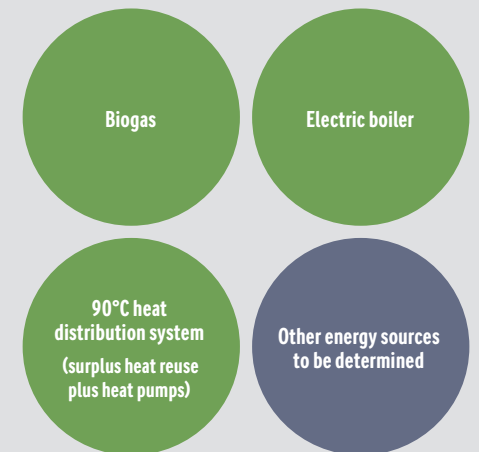
The expansion of Danmark Protein is critical to our company's future growth. For this purpose, we launched a utility master plan in 2021 to develop the plant's infrastructure. Heat recovery and reuse is a key element.

One initiative in progress is the development of an energy water system in filtration areas. For this purpose, we are building a 90°C system to recover heat from the plant's biogas motors and, eventually, from heat pumps. The system will then provide hot water for various heating purposes that currently rely on steam – for example for heating air in the spray-drying towers. The energy water system should become available to all filtration areas at the site during 2024. Potential CO<sub>2</sub> savings are estimated at 2,400 tonnes.

Over the past year, we also completed the construction of a redistribution system for 60°C surplus heat generated



## Anticipated energy mix at Danmark Protein in 2030



Danmark Protein is expanding to meet future production needs. By 2030, the plant's heat requirements will increase by 65% compared to 2022. The plant infrastructure is being developed to meet this need without increasing carbon emissions. The green circles indicate technologies under implementation. Some future energy sources are still to be defined.



# ENERGY (CONTINUED)

by the four compressor stations at Danmark Protein. The connection of the last remaining compressor station to the system means it can now heat the lactose and hydrolysate departments, replacing the gas-fired steam heating system. Total energy savings from the system are equivalent to the heating requirements of 159 average Danish households – a saving of 632 tonnes CO<sub>2</sub>.

## Energy-saving cleaning

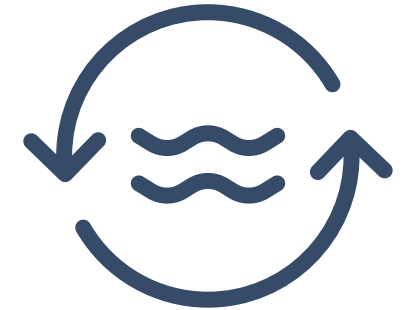
In Germany, our joint venture site ArNoCo is preparing to pilot the use of ultrasound to remove deposits from the heat exchanger in lactose production. The goal is to reduce steam consumption during production – bringing an anticipated energy saving of at least 250,000 kWh a year. Following an evaluation of results, the technology will be adapted for use at other Arla plants.

At AFISA in Argentina, a project to recover nitric acid solution from the cleaning in place (CIP) system is planned for kickoff in 2023. Significant energy savings are expected from reusing the pre-warmed cleaning agent in more CIP processes. Nitric acid consumption will also be reduced by around 50%.



# WATER

Business growth is increasing our water needs. Investments in water reuse and recycling will reduce our reliance on well water.



## New plan to tackle change

Water optimisation is, at all times, about expanding our ability to reuse and recycle water extracted from whey and reducing our reliance on well water supplies. During 2022, we have turned our attention to a series of developments that will impact the balance between whey water and well water.

One of the challenges we are facing is that our whey suppliers are increasingly concentrating the whey prior to transport. While this makes sense in terms of reducing carbon emissions, it means less water is entering our plants with the whey – water that we rely on to minimise our use of well water.

At the same time, Danmark Protein is expanding significantly, with the construction of two large filtration areas now underway and further expansions on the horizon.

To address these changes, we have evaluated the consequences in terms of our water needs and environmental commitments. The objective is to develop a new scope and ambition for our water workstream.

## Wastewater recycling

Our major investment in a technical water facility has a central role in our water recycling programme. The facility is placed close to the local treatment plant that receives the wastewater discharge from Danmark Protein, ARINCO and the neighbouring Arla Foods Nr. Vium dairy.

Operation began in late 2021, when the wastewater

treatment plant began sending cleaned wastewater to the facility for further filtration and upgrading to technical water. When running at full capacity, the facility supplies Danmark Protein with 500m<sup>3</sup> of technical water a day for use in the cooling towers.

In 2022, our efforts have focused on optimising the facility and reducing operating costs. We are now planning the next expansion up to 900m<sup>3</sup> a day – a step on the way to the maximum daily recycling capacity of 2,000m<sup>3</sup>, which is equivalent to around half of Danmark Protein's current well water consumption.

## The DRIP Partnership

Initiation of the technical water facility began with our involvement in the DRIP Partnership. Over seven years, the partnership brought five research institutes and 13 companies together to develop new technology that would cut well water use in the food industry. The recycling of wastewater into technical water stems from the partnership's 'water-fit-for-purpose' concept. According to the partnership's final report from 2022, the participating companies reduced their water consumption by 20% due to this and other DRIP-inspired solutions.

## Water-saving initiatives

Reducing water consumption without impacting product quality and food safety is an ongoing priority. In 2022, our external partner Ecolab conducted a total plant assessment (TPA) of Danmark Protein and ARINCO to identify new opportunities for water savings. This has resulted in a compendium of recommendations, ranging from

quick wins to larger investments. The water savings will be accompanied by reductions in energy consumption, chemical use and product loss.

Further efforts have gone into improving the transparency of water consumption data and increasing data availability by installing more flow sensors in production. This not only improves our ability to measure and compare performance across sites. Better data capture has also enabled us to expand our on-site water monitors, giving process operators a better overview and ensuring a fast response to a sudden spike in water consumption.



# WATER (CONTINUED)

## Data-driven cleaning

Cleaning in place (CIP) processes are critical to securing high product quality. As such, they account for a large share of our well water consumption, making them an obvious subject of scrutiny during the week-long TPAs.

At ARINCO in 2021, successful pilot trials used sensors to track contaminants in rinse water and indicate when processing equipment is sufficiently clean. This delivered a 24% reduction in water use and 14% reduction in cleaning time. We see this data-driven approach as the way forward for managing continuous CIP improvements across our fully owned sites – with big potential from a water and energy-saving perspective.

Water-saving investments at our joint venture sites include the installation of new CIP equipment at MVI in the UK. Combined with the use of recycled whey water, this has reduced water consumption by 10%.

## Filtration research and development

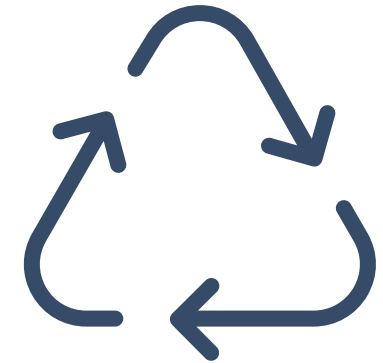
Whey protein isolate (WPI) production is Denmark Protein's most water-intensive process. Over the past year, our Innovation Centre has developed an online filtration monitoring system with potential to reduce water use during the process by around 50%. Due for trial in January 2023, the system promises additional energy savings by eliminating a step in WPI processing.

A further project to replace ultrafiltration with electro-dialysis (ED) separation technology could bring further water savings to our whey processing lines in the future. ED is an efficient means of removing minerals from the whey with less water, energy and chemical addition. Other possibilities include using ED to reduce the salt load of wastewater before discharge to the wastewater treatment plant.



# FOOD WASTE

Our raw materials are a valuable resource. A refined approach is now monitoring how well we use them.



## Capturing and validating food waste data

At Arla Foods Ingredients, we continue our efforts to make the best possible use of our raw materials. Our processes and production side streams are the subject of ongoing research and development for this purpose.

Nevertheless, we are not yet at the stage where all food waste can be avoided. In 2021, we established our food waste workstream and started work on a new platform for monitoring food waste and capturing the necessary data to track our performance. The Arla group goal is to reduce food waste at processing level by 50% from 2015 to 2030.

We have continued this work through 2022 in collaboration with our parent company. One of our key focus areas is data validation. Some of our product waste, for example, can be measured in the chemical oxygen demand (COD) value of wastewater. For this reason, we regularly monitor how much COD stems from lost whey and milk components and how much from cleaning agents.

## KPIs for powder waste

Key performance indicators (KPIs) are now in place for powder waste. At Danmark Protein, for example, our KPI for 2022 was to limit such waste to maximum 0.32% of our total finished products – a reduction on our 2021 KPI of 0.35%. This KPI has proven hard to achieve. One explanation is the identification of additional waste streams that were not included in our 2021 figures.

By the end of the year, food waste volumes were fully mapped. The next step in 2023 is to identify the precise source of these waste streams. This is necessary data to monitor waste generation through our value chain and inform decision-making about how to improve.

## Programming quick win

Sharp-eyed operators at Danmark Protein have saved around 16 tonnes of whey protein isolate (WPI) a year from going out with the wastewater. After remnants of WPI were spotted in the drain, it was found that the system was failing to rinse the last part of a product batch into the tank. A similar observation was made on another line producing our MFGM ingredient, where four tonnes of product were saved. In both cases, the cause of the problem turned out to be an easily-corrected programming error.

The discoveries have followed last year's introduction of a line-centric organisation, which encourages all colleagues to keep an eye out for improvement opportunities.

## How we define food waste

Food waste covers all material waste along the value chain that was initially intended for human consumption. However, it is the waste destination that determines which material volumes are reported as food waste.

While whey and milk components sent for biogas production or land disposal do qualify as food waste, those components diverted for use in animal feed do not. This is because they remain in the food chain.

As a business-to-business company, Arla Foods Ingredients is concerned with food waste that occurs during production and logistics.



# PACKAGING

Our packaging strategy has two clear goals – full recyclability and the phase-out of fossil-based virgin plastic by 2030.



## Towards full circularity in packaging

Ensuring the safety and quality of our products through shelf life requires the use of complex packaging types. Infant formula, for example, must retain its high microbiological quality, nutritional profile and functionality for anything up to two years in storage. For this reason, our commitment to replacing fossil-based virgin plastic is one of the biggest challenges we face to achieve the objectives of our packaging strategy.

We continue to work towards two primary goals: to ensure all our own-brand packaging is recyclable by 2025 and to phase out fossil-based virgin plastic by 2030. The group-level ambition is that all packaging materials – paper, cardboard, plastic and metal – should be fully circular in 2030.

With regard to the recyclability of materials, we are close to achieving our target. The limitation is the need to ensure the suitability of food-contact materials. At present, there is still no alternative to an inner layer of virgin plastic. We continue to explore possible solutions in collaboration with our parent company.

## Closed loop recycling

In 2022, new EU legislation created an opening for closed loop recycling of food contact plastic. This requires careful control and processing in a dedicated plant to prevent cross-contamination with non-food packaging. We see this as an interesting opportunity and are currently discussing feasibility with customers and our big bag supplier. Performance, food safety standards and commercial

viability must all be secured before closed-loop recycled plastic can become a reality.

With regard to non-food contact packaging, however, recycled plastic already shows good potential. Tests are now complete on stretch film made from 51% post-consumer recycled plastic. The film will be implemented as pallet wrap in the near future.

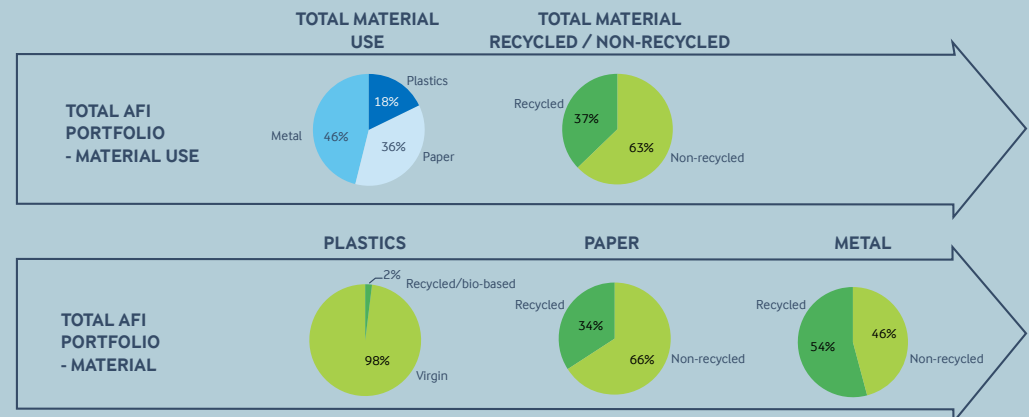
## Focus on circular value

Following a 2021 evaluation of all our existing packaging materials, we have begun investigating ways to increase their circular value. A primary initiative in 2022 has been to change the colour of the plastic inner liner in our small bags from dark blue to light blue, as this makes it easier to recycle. Coloured plastic is important to our customers, who can then see any plastic fragments that get into our product when the bag is opened. The light blue plastic remains highly visible, ensuring no compromise in food safety.

## Phase-out of safety caps

For consumer products that are filled into cans, we use a plastic safety cap with a tamper-evident strip, which is torn away when the cans are opened. To reduce our plastic use and the risk of these small strips entering the environment, we are in the process of replacing the safety caps with an alternative snap-on lid. Compared to 2020, which was the last full year of using safety caps, the phase-out will cut plastic consumption by an estimated 30 tonnes a year.

## Packaging materials by type and recycling level



Data provided by suppliers in 2021 and covering Danmark Protein, ARINCO, AFISA and ArNoCo



An elderly couple is walking outdoors in a grassy field. The woman on the left has short white hair, wears glasses, a blue jacket over a striped shirt, and dark pants. The man on the right wears a red cap, glasses, a dark blue jacket, and dark pants, and is holding a white water bottle. The background is a soft-focus landscape with a body of water and hills under a cloudy sky.

# STRONGER PEOPLE

Through our business activities and in our workplace, we want to make a positive difference in people's lives. Strong partnerships enable progress.

# THE COLLABORATIVE ROAD TO BETTER HEALTH AND WELLBEING

Our ambition to support health, wellbeing and sustainable, nutritious diets depends on continuous innovation and broad collaboration with partners whose capabilities extend beyond our own. Through these efforts, we strive to create new opportunities to make a positive impact on people's lives.

The Stronger People pillar of our new sustainability roadmap guides initiatives in pursuit of this ambition. In the roadmap's first wave from 2022 to 2023, we will both continue our existing affordable nutrition partnership projects and redefine the scope and goals of our work with lifelong nutrition.

Like our parent company, we are inspired by the UN Food and Agricultural Organization's definition of sustainable healthy diets – that they should promote all aspects of

the individual's health and wellbeing, have low environmental impact and are accessible, affordable, safe and culturally acceptable.

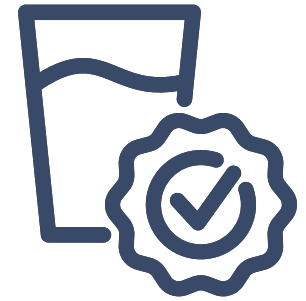
Over the past year, our scoping activities included a review of our affordable and lifelong nutrition activities in relation to the UN SDGs. Guided by tools and business indicators from the SDG Compass, we have mapped our current high-impact areas as a means to setting the strategic direction for future steps. In 2023, we will revise our focus areas within lifelong nutrition based on this work.

Stronger People is, naturally, also about ensuring the health, safety and wellbeing of our colleagues in Arla Food Ingredients. The development of our workplace culture is an ongoing priority as our business grows.



# QUALITY & FOOD SAFETY

Our quality & food safety systems remained in focus in the face of fast-changing markets through 2022. Digital tools are strengthening our procedures and mindset.



## Becoming the trusted partner for safe ingredients

High quality and food safety standards are our primary responsibility as a supplier of specialised ingredients to the food industry. In 2022, global supply shortages have put extra pressure on our quality and food safety (Q&FS) management systems, with some customers requiring deliveries at shorter notice. This has tested our ability to remain agile without compromising standards.

Ingredient solutions for infant nutrition, the elderly and people with nutrition-related health conditions have become an increasingly important part of our business over the years. Since 2017, we have implemented a rigorous Q&FS strategy to develop and sharpen our capabilities, secure the robustness of our management systems and improve our quality and food safety mindset. The quest for excellence is fundamental to our Stronger People ambition.

Not even the best system in the world can succeed without the right in-house mindset. To ensure this, our Q&FS culture is still in focus through rolling training and knowledge exchange. In the autumn, we conducted a survey to take the temperature on the Q&FS culture at our production sites, within our research and development teams and in our global quality department. This found that our mindset is on the right track, allowing us to concentrate on strengthening our culture further.

The second wave of our Q&FS strategy is now complete. During this time, we have noted a significant decline in product-related complaints and increasingly positive customer feedback about product quality (see page 24 for more information).

From 2023, wave three will begin – the next step in our ambition to become the most trusted partner for safe, nutritious and high-quality ingredients. This will include dedicated activities aimed at building trust and transparency through customer engagement.

## Digitalisation platforms

The digitalisation of our quality processes has improved our ability to track non-conformities and ensure compliance across locations. In 2022, we worked on additional digitalisation projects within our supply chain operations. The goals are to improve quality, optimise use of resources and support business growth.

At Danmark Protein, a datahub has been set up to take the plant to a new level of data-driven performance and sustainability. The hub will be introduced to other sites once fully established and fine-tuned.

The launch of digital performance boards at Danmark Protein makes use of the latest digital tools. Replacing weekly paper reports, the boards provide daily updates on how each department is progressing in relation to a series of key performance indicators.





# LIFELONG NUTRITION

Collaborative clinical studies are the bedrock of our commitment to safe and healthy nutrition for all – generating knowledge about how we can support special needs.



## Mapping the nutritional potential of dairy ingredients

The human need for nutrition changes through life, from infancy to old age and during periods of ill health. At Arla Foods Ingredients, we play a part in addressing those needs by mapping the nutritional potential of milk and whey and applying that knowledge to our ingredient solutions.

Partnerships with independent research institutes are essential through all these efforts. Working together, we identify new areas where our ingredients could make a difference in foods for special needs and secure documentation through collaborative clinical studies.

During 2022, our clinical studies had infant and elderly nutrition, type 2 diabetes and kidney diets in focus.

## Infant growth and metabolism study

A clinical study to evaluate the effect of various infant formulas on growth and metabolism has followed 320 infants from the age of four to eight weeks and up to three years.

The study has compared a protein-reduced infant formula enriched with alpha-lactalbumin with another protein-reduced formula, a standard formula and breast feeding. The purpose was to determine whether the growth and metabolism of infants who received the alpha-lactalbumin-enriched formula were more similar to that of breast-fed infants.

Previous research suggests that infant formula with a protein content and amino acid composition closer to that of breast milk may reduce the risk of childhood overweight. There may also be potential to reduce overweight, obesity and related health challenges in later life.

Arla Foods Ingredients has sponsored the study, with Skåne University Hospital, University of California Davis and Umeå University as research collaborators. The initial findings are expected to be published in the coming months.

Infant formula is an important source of nutrition for infants without access to breast milk. Where breast milk is available, Arla Foods Ingredients follows the World Health Organization recommendation for exclusive breastfeeding during the first six months of an infant's life and partial breast-feeding up to the age of two in combination with appropriate complementary foods.

## Safety study of partial hydrolysates

The European Food Safety Authority enforced a new regulation in 2022 that requires clinical safety documentation of all hydrolysed proteins used in infant formulas. Against this background, we have partnered with Umeå University and Lund University in Sweden to conduct a clinical study of two partial hydrolysates.

Recruitment of an estimated 312 healthy infants aged from four to eight weeks is currently in progress. For minimum three months, the infants will receive a standard infant formula or one of two infant formulas based on



the partial hydrolysates. Only infants without access to breast milk will be included in the formula-fed groups. A reference group will comprise breast-fed infants.

The objective is to measure the infants' weight at five months of age along with length and head circumference as other indicators of normal growth. Markers of gastrointestinal comfort, allergy and inflammatory response will also be evaluated.

The study is scheduled for completion in mid-2026.

## Vaccine response in the elderly

Preliminary research suggests that osteopontin (OPN) plays a part in the development of infant immune functions. But no clinical study has yet investigated whether

the whey protein can support the immune response of another vulnerable consumer group – the elderly.

In 2022, we initiated a clinical study with Dutch clinical research organisation NIZO to document the potential effect of OPN on the immune response of elderly subjects to a vaccine – an endpoint recommended by the European Food Safety Authority for the scientific substantiation of claims related to immune defence against pathogens.

Over the course of 14 weeks, the 140 participants – all healthy adults over the age of 65 – will receive a daily dietary supplement with or without OPN. Following vaccination against hepatitis B towards the end of the study, the immune response will be measured by analysing the level of antibodies in blood samples.

# LIFELONG NUTRITION (CONTINUED)

To our knowledge, the OPN study is the first in adults. If a positive effect on immune response is shown, then there could be basis for further studies of OPN's potential role in slowing the decline of the immune system during ageing.

## Study of blood glucose response

Previous studies of people with type 2 diabetes have shown that whey protein can reduce blood glucose fluctuations after a meal. A recently completed PhD study conducted at Newcastle University in the UK has now investigated the effect of consuming a ready-to-drink shot with just 15g whey protein in adults between the age of 40 and 60, all with type 2 diabetes.

The 18 participants tested the protein-enriched shot for seven days and a control drink for seven days, consuming them three times daily prior to each main meal. All were fitted with a continuous blood glucose monitoring sensor throughout the study.

The results showed that, when participants received the protein-enriched shot, their glucose levels were closer to the recommended guidelines – despite the very low protein dose. In fact, they spent two more hours a day in a healthy glucose range than when they consumed the control. This positive outcome suggests that a convenient whey protein premeal shot could benefit type 2 diabetes management.

Arla Foods Ingredients provided funding for the study\*.

## Muscle maintenance in CKD patients

More than 800 million people globally are estimated

to have chronic kidney disease (CKD), according to the American Society of Nephrology. Depending on the severity of the disease, CKD patients may be advised to minimise their intake of phosphorous-rich foods such as meat and dairy products to avoid health risks related to mineral build-up in the kidneys. Because these foods are primary sources of dietary protein, people on a renal diet are at higher risk of protein malnutrition and subsequent loss of muscle mass.

A clinical study at Maastricht University in the Netherlands is investigating whether beta-lactoglobulin (BLG) – a novel and patent-protected whey protein ingredient rich in essential amino acids but very low in phosphorous – can help maintain muscle mass in CKD patients.

Planned to run for six months, the study will recruit 20 patients with advanced CKD but not yet in need of dialysis. Participants will receive a BLG-supplemented drink on alternating weeks, while their muscle synthesis will be measured throughout.

We are providing BLG and funding for the study.



## Milk matters in malnutrition

Arla Foods Ingredients supports the research of Project Peanut Butter and Washington University in St. Louis to identify the most impactful ingredients in ready-to-use supplementary foods (RUSF) for malnourished children. In October, Professor Mark Manary and Dr Kevin Stephensen visited Denmark, where they presented the results of their Milk Matters clinical study.

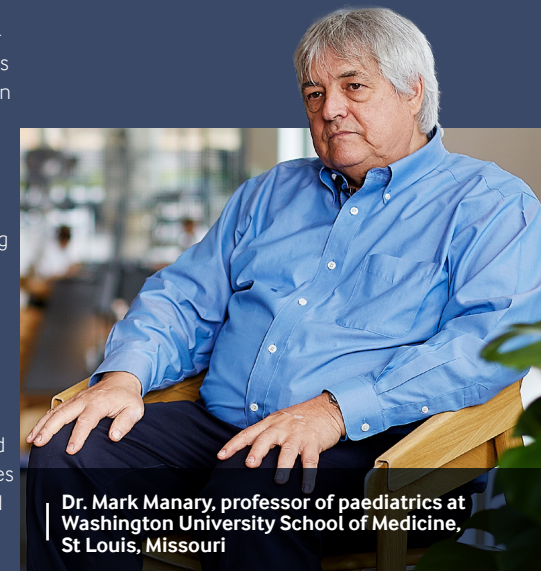
Previous research had established that RUSF made with dairy ingredients improves child recovery from moderate acute malnutrition (MAM). The purpose of this study was to investigate why milk makes a difference by comparing the effect of various RUSF recipes made with milk and/or plant-based sources of protein and carbohydrate.

Over two years, the study recruited around 1,000 children aged six months to five years for the individually randomised, doubled blinded trial at ten feeding clinics in Sierra Leone. Recovery from MAM and potential changes in gut permeability, the intestinal microbiome and metabolome were followed during this time.

The results disprove ideas that the effect of milk ingredients could rest with their high digestibility and beneficial impact on gut bacteria. All the RUSF recipes were found to have a similar effect on gut health and the microbiome.

However, a difference was seen in the metabolome of children treated with the RUSF containing milk protein and carbohydrate. This suggests that the dairy ingredients activate different metabolic pathways – a possible clue to why milk matters in malnutrition treatment.

Arla Foods Ingredients provided the whey protein and permeate used for the study, which was also sponsored by the Danish Dairy Research Foundation.



**Dr. Mark Manary, professor of paediatrics at Washington University School of Medicine, St Louis, Missouri**

# AFFORDABLE NUTRITION

Ensuring responsible business conduct is a constant priority in our work with affordable nutrition. Co-developed business models are now reaching new markets.



## Collaborative efforts to relieve malnutrition

Partnerships for developing and sharing new models for sustainable food supply chains are the core of our work with affordable nutrition. In this, we collaborate with NGOs, government organisations, knowledge institutions and other companies.

The unwavering focus of these public-private projects is to facilitate commercially viable, local production of affordable food products in developing countries. At the heart of each project lies one overarching mission: to relieve the burden of malnutrition and its consequences for children and young mothers in particular.

A thorough understanding of local contexts and needs is the essential starting point for every project. Equally important, we must constantly evaluate our own conduct as a business and the risks of causing unintentional harm.

In 2021, we took a step back and shaped a new framework for responsible business conduct (RBC), basing it on three pillars: the mitigation of negative impacts and risks; the creation of positive impact and the integration of RBC in all operations.

Today, there is a growing interest in affordable nutrition partnerships, which means we are regularly invited to talk about our experiences of best practice. This experience is also the backbone of our RBC framework.

The Global Alliance for Improved Nutrition (GAIN) and DanChurchAid have been particularly close partners from the outset of our project involvement. The documented



business models we have co-developed are accessible via the Scaling Up Business (SUN) Network.

## Knowledge transfer to Tanzania and Pakistan

The GAIN Access to Better Dairy project in Ethiopia was our first as a member of the GAIN Nordic Partnership. Towards the end of 2021, the Danish International Development Agency agreed to fund the project for a further two years. Project partners are now investigating more possibilities to improve milk utilisation, reduce food waste and develop a greener business model for the production of affordable dairy products.

Still in collaboration with GAIN, we are now transferring our knowledge from Ethiopia to new projects in Tanzania and Pakistan.

In Tanzania, we are helping a dairy make the best possible use of available milk. The aim is to make dairy nutrients accessible to more consumers by developing an affordable yoghurt. Small pilot trials are currently underway to fine-tune the texture. We expect to support a commercial-scale production trial at the dairy in 2023.

The Pakistan project focuses on turning the whey side streams from cheese production into a new business model for affordable nutrition. Here, we are working with four dairies to develop an acidified whey drink as an alternative to a conventional soft drink.

## Climate-resilient chickpea biscuit

Bakery specialists from Arla Foods Ingredients and Novozymes visited Ethiopia in February to optimise the



recipe for an affordable, protein-enriched biscuit and train the team who will produce it at Moya Foods Complex in Addis Ababa.

The biscuit is the outcome of a two-year project to build a climate-resilient food supply chain, based on nutritious chickpeas grown by local smallholder farmers.

Funding was provided by P4G – a global forum that supports public-private partnerships aimed at accelerating sustainable development. At the close of the project, we joined DanChurchAid, Bopinc and other partners at a P4G virtual roundtable event to share learnings and discuss solutions for tackling the global food crisis.

# AFFORDABLE NUTRITION (CONTINUED)

## Value chain for papaya waste

Major fruit crops such as papaya and mango succumb easily to spoilage. As a result, large volumes of these vitamin-rich fruits are lost each year.

In Ethiopia, we are working with GAIN to turn waste papaya fruit into a nutritious and affordable snack bar for low-income households. The goal is to establish a fruit processing value chain to reduce malnutrition, create jobs and cut post-harvest papaya loss.

During November, we invited GAIN and Theday Agro Industry to a recipe fine-tuning and training session at our application centre in Denmark. Theday will produce the bar at their plant in Addis Ababa, using a final recipe that combines papaya pulp with milk and whey-based ingredients to raise the protein content.

Several other Ethiopian companies are involved in the project, including an agricultural engineering enterprise. The Confederation of Danish Industry and Addis Ababa Chamber of Commerce are also working with Ethiopian business associations to establish the enabling environment for the business model.

Funding from the Danida Market Development Partnerships programme is supporting the project.

## From dairy waste to circular business

Kenyan dairies process 634 million litres of milk a year, but much of that is lost in production side streams. The VALORISE project is examining how circular bioeconomy principles can be applied to reduce this waste and help dairies diversify their business.



As a partner in this collaborative research project, we will be mapping the side streams and identifying potential product development opportunities.

VALORISE is a multi-stakeholder project led by Roskilde University and supported by the Danish Ministry of Foreign Affairs.



# CARING FOR PEOPLE

A good workplace should be safe and empowering. Initiatives in 2022 have targeted diversity, inclusion and critical safety areas.



## A work environment with people in focus

An inspiring and inclusive work environment is one where everyone is valued and feels that they belong. For us at Arla Foods Ingredients, this is about nurturing a safe and enabling culture that allows each colleague to perform to the best of their abilities and develop their skills.

Every year, our colleague engagement survey takes the temperature on how we are doing as a workplace and where we need to improve. Most colleagues take the time to respond – 92% in 2022 – and the feedback indicates we have a highly engaged workforce with a

widely expressed intention to stay within the company. Our priority is to consolidate our position as an attractive workplace with people in focus (see the Ambitions & Progress Data chapter for more information about the survey).

## Follow-up improvements

Several 2022 initiatives have followed up on improvement areas identified by the 2021 colleague engagement survey.

Colleagues at Danmark Protein had expressed a wish to have more influence on sustainability in their daily work. In response, we have put ‘sustainability at work’ on the agenda of the regular development dialogues between managers and teams. During 2022, everyone at the site was invited to consider actions they can take to save resources – from saving water to turning off computer screens at the end of the working day. Our latest survey shows a clear impact from this initiative.

Although the engagement survey shows a steady decline in unacceptable workplace behaviour, we continue to make concerted efforts to reach our zero incident goal across our organisation. Internal communication initiatives and dialogue at work environment meetings are primary tools in this respect.

## Diversity and inclusion

Over the summer, we joined the Arla diversity and inclusion programme, starting with a series of kick-off days.

Since then, all top leadership teams have taken part in workshops on inclusive leadership, and key performance indicators have been developed to follow progress. Initial focus areas include avoiding unconscious bias, for instance with regard to gender, race and religion. Ahead lies the task of determining how we can integrate diversity and inclusion in our everyday ways of working.

## Behavioural safety culture

With business growth comes an expanding workforce and a bigger responsibility to keep workplace safety top of



mind. All our sites, with the exemption of ArNoCo, follow the continuous improvement targets of our Cornerstones behavioural safety programme. ArNoCo is enrolled in the equivalent occupational safety programme of our joint venture partner DMK.

During 2022, many colleagues across our sites have participated in bespoke risk assessment training. The rising number of risk observations they report is a positive reflection of our developing behavioural safety culture. All colleagues at Danmark Protein, for example, are required to identify at least four risks a year.

Accident frequency has continuously declined over a number of years. Unfortunately, in 2022 we experienced a 50% increase. Although the accident frequency rate



# CARING FOR PEOPLE (CONTINUED)

is still relatively low, this underlines the importance of continuing our behavioural safety programme. At AFISA and MVI, there have been no lost-time accidents for the past five and six years respectively.

## Critical health and safety areas

Over the past three years, mandatory standards and competence-building activities have addressed specific areas of health and safety identified as high risk. In early 2022, our safety maturity journey entered the next phase with the introduction of targeted health and safety audits to raise awareness of these critical areas and ensure proactive compliance. Based on these audits, our focus areas for 2023 will be 'permit to work' and 'lock out/tag out' (LOTO).

In Denmark, our permit-to-work system – which authorises named people to carry out specific tasks in potentially hazardous areas – mainly applies to hot work, such as welding or using a blowtorch to lay roofing felt. In the year ahead, we will focus on implementing the system in other high-risk areas, such as working at height and in confined spaces.

The LOTO procedure ensures machines are taken safely out of operation for adjustments, maintenance and cleaning. Due to the diverse nature of our machinery and processes, the procedure must be tailored to each line – a major task for our large processing plants. The safety procedure is now fully implemented at AFISA and MVI. At Danmark Protein and ARINCO, LOTO implementation will be finalised in 2023.

## Fire at Danmark Protein

A fire in the boiler house next to a spray-drying tower at Danmark Protein was brought quickly under control in August. No colleagues were present when the fire occurred, and those working in other parts of the plant were evacuated.

After a temporary solution was put in place, the boiler house, which supplies the tower with hot air, was back in operation a month later. We are now investigating a long-term solution which will combine the use of our 90°C heat recovery system with natural gas and electricity – in line with our transition to low-carbon technology.





# AMBITIONS & PROGRESS DATA

This year's global energy crisis underlined the urgency of transitioning to sustainable energy sources, while volatile markets placed added pressure on quality and food safety management. In this chapter, you can read how we performed in 2022 and our priority actions for 2023. For information about policies and key environmental, social and governance (ESG) metrics that apply to the entire Arla Foods group, please see the Arla annual report.

# FOOD SAFETY

## Ambition

We aim to deliver quality and food safety above and beyond the expectations of customers, consumers and the authorities at all times. As a supplier to the infant nutrition sector, the youngest, most vulnerable consumers define the quality of all our products for the food industry.

## Priority actions

The second wave of our Quality & Food Safety (Q&FS) strategy is now complete. In 2023, we will commence our third-wave activities, aimed at strengthening customer engagement.

Priority actions include:

- Continuing the development of our Q&FS culture
- Reviewing digital solutions for quality management and exploring new options
- Ensuring that we deliver our quality promise in accordance with customer needs

## Progress

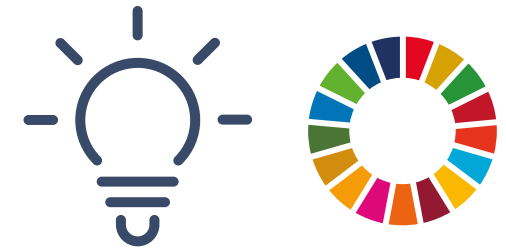
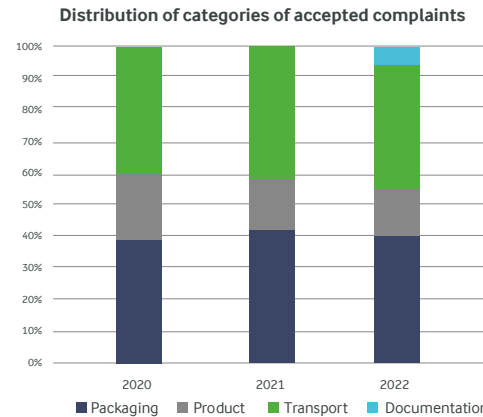
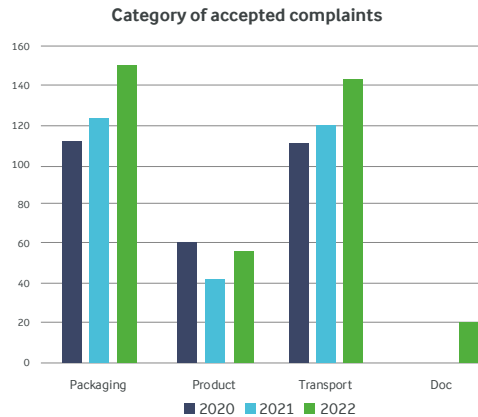
Since 2017, our Q&FS strategy has focused on strengthening our quality and compliance organisation. The number of people working in our quality departments has almost doubled during this time.

Against this backdrop, our most recent customer survey from 2021 shows a continuing improvement in customer perceptions of product quality. The next customer survey will take place in spring 2023.

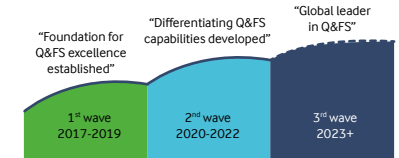
In February, we introduced a new complaints system, which now registers complaints per order – under the previous system, several orders could be included in one complaint. The system has also gained a fourth complaint category, which covers errors in the documentation dispatched with each delivery.

Consequently, we have seen an increase in overall complaints in 2023. While product-related complaints also went up for this reason, the general trend is still downward, in line with what we have seen since the introduction of our Q&FS strategy in 2017. ARINCO is included in our 2022 complaints performance data for the first time.

## Complaint performance



## Our Quality & Food Safety strategy



## Impact

### On society

Any food safety issue with our ingredients is a risk to consumer health – including the health of infants, the elderly and those on special clinical diets.

### On Arla Foods Ingredients

It only takes one food safety incident to damage our reputation and lose the trust of our customers. At the same time, we are keen to avoid quality issues caused by inefficient production and which lead to raw material waste.

### On Sustainable Development Goals





# NUTRITION

## Ambition

We are committed to driving innovation for healthier lives via our research and development efforts. Using our ingredients and knowhow, we want to play an active role in projects to reduce and prevent malnutrition among children and young women in developing countries. Partnerships with research institutes, NGOs and other organisations are essential to achieving these objectives.

## Priority actions

In line with our new sustainability roadmap, we will use 2023 to redefine the scope and ambition level of our efforts within lifelong nutrition. This work will include mapping and aligning activities with the UN SDGs.

We will continue to focus on partnership projects that support sustainable, affordable and nutritious food systems in developing countries. In Pakistan and Kenya, we are in dialogue with local dairies about how to utilise dairy side streams for the production of new affordable products. Through 2023, we will work with industrial tests of product prototypes with a view to commercialisation in 2024.

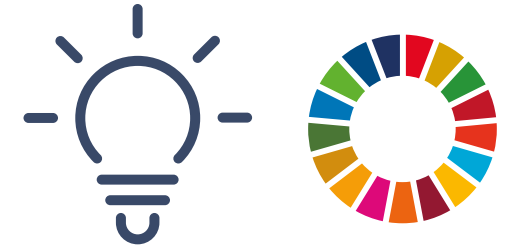
## Progress

Arla Foods Ingredients is sponsoring the following clinical studies:

- The effect of protein-reduced infant formula enriched with alpha-lactalbumin on the growth and metabolism of formula-fed infants
- The safety of two partial hydrolysates in infant formula
- The effect of osteopontin on the immune response of the elderly
- The effect of beta-lactoglobulin on muscle mass maintenance in people with chronic kidney disease
- The impact of milk ingredients in ready-to-use supplementary foods on recovery from moderate acute malnutrition
- The effect of dietary supplementation with whey protein concentrate on weight gain and recovery in tuberculosis patients in Guinea-Bissau

During 2022, results were published from a sponsored clinical study conducted at Newcastle University, UK. This had investigated the effect of whey protein on blood glucose response in people with type 2 diabetes.

In our partnership projects with GAIN, DanChurchAid and others, we have taken further action to transfer sustainable dairy business models to more developing markets. This work includes developing a sustainable value chain for a protein-enriched biscuit in Ethiopia – a project that was concluded in 2022.



## Impact

### On society

People's nutritional needs change from birth through childhood to adulthood and the senior years – and they vary from one person to the next, depending on expectations for personal performance and general health. Arla Foods Ingredients contributes to nutrition for life.

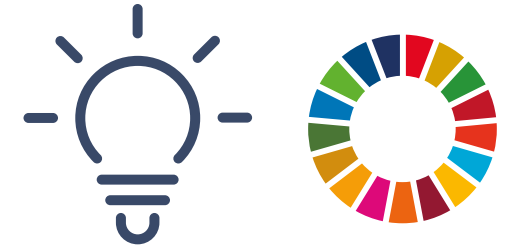
### On Arla Foods Ingredients

The future of our company depends on our ability to operate and grow in a sustainable, responsible manner in line with the expectations of internal and external stakeholders.

### On Sustainable Development Goals



# HEALTH AND SAFETY



## Ambition

The health and safety of the people who work at or visit the Arla Foods Ingredients sites is a top priority. Our target is zero work accidents and a working environment that empowers, engages and never compromises the physical or mental health of any colleague.

## Priority actions

The small rise in accident frequency during 2022 highlights the importance of a sustained focus on behavioural safety as we expand our workforce to support business growth.

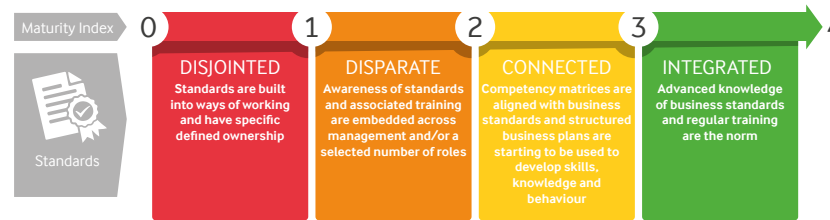
Our fully-owned sites Danmark Protein, ARINCO and AFISA are working towards level 3 of the Arla Cornerstones behavioural safety programme, which they are expected to reach in 2023.

In addition to embedding a zero-loss culture, level 3 requires demonstration of Visual Felt Leadership (VFL). An increase in the number of risk observations reflects the focus on internalising the behavioural safety mindset. All colleagues are required to identify and report four risks a year.

MVI is now following the behavioural safety plans for the Arla Tav Valley dairy, where it is located. The site has previously achieved Cornerstones level 3.

ArNoCo will continue implementing the TIGER behavioural safety programme of our joint venture partner, DMK, which began at the site in 2022.

## Cornerstones behavioural safety programme - maturity index

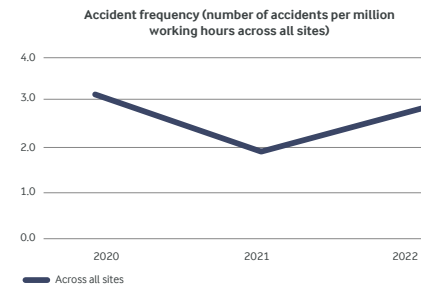
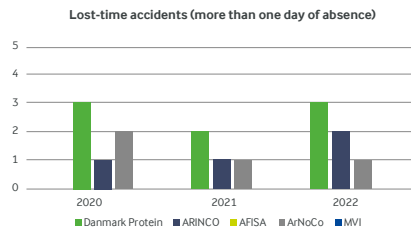


## Progress

### Workplace accidents

Our behavioural safety programme Cornerstones has contributed to a steady decline in accident frequency (number of lost-time accidents per million working hours) since we began implementation at our sites in 2017. In 2022, however, the downward trend did not continue, as both Danmark Protein and ARINCO experienced an increase in lost-time accidents.

Accident frequency consequently rose from 1.8 in 2021 to 2.8 in 2022, with a total of six lost-time accidents across sites. Although this is not a desirable outcome, the accident frequency rate remains relatively low and still significantly improved compared to 2017, when the rate was above 10. AFISA and MVI recorded zero lost-time accidents for the fifth and sixth consecutive year, respectively.

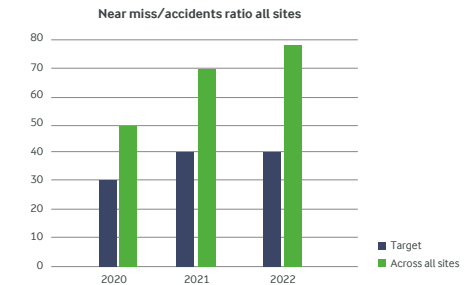


### Near miss/accident ratio

Our near miss/accident ratio (number of near miss and risk observations per accident) is a leading indicator of our proactive approach to improving safety in the workplace.

The purpose of the indicator is to increase our focus on observing and removing unsafe conditions, actions and behaviours and, ultimately, to reduce the number of workplace accidents overall.

In 2022, our near miss/accident ratio was 76:1 – well above our target of 40:1. We have set the same target for 2023.



## Impact

### On society

There are many risks to health and safety in a company like ours that operates large processing plants and relies on transportation of raw materials and finished products. Our licence to operate is dependent on our ability to minimise those risks and provide healthy and safe working conditions.

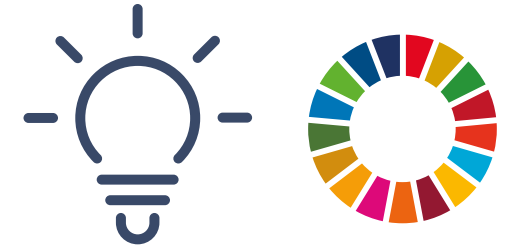
### On Arla Foods Ingredients

Every health and safety incident in or around our sites threatens our ability to attract competent colleagues and represents a business risk in terms of lost efficiency and profitability and reputational damage.

### On Sustainable Development Goals



# CARING FOR PEOPLE



## Ambition

We want to nurture an inclusive, engaging culture with a workforce that represents diversity of thought and to provide equal opportunities for personal and professional growth. In this way, we aim to gather our global organisation around our shared mission and 'ONE Arla Foods Ingredients' mindset.

## Priority actions

Our priority in 2023 is to maintain the positive results from our 2022 Barometer engagement survey and become stronger in areas that need improvement.

We will continue to:

- provide a safe, empowering and supportive culture for all colleagues
- enable managers to deliver a performance-oriented environment
- embed a culture that supports diversity, inclusion and belonging
- drive down unacceptable behaviour

To address improvement areas, we will:

- initiate local dialogues to recognise and drive change in areas where bureaucracy is seen to be a challenge
- address the concerns of production site colleagues about strengthening individual accountability for performance
- identify ways to build digital capabilities to support digitalisation across the company

## Progress

In 2022, we conducted our Barometer engagement survey using a new set of questions. A high 92% of colleagues participated in the survey across all sites. Overall, the results suggest we have an organisation that is healthy and in good shape.

Although the new questionnaire means this year's scores are not directly comparable with last year, a favourable engagement score of 89% indicates that the level of colleague engagement remains high. The engagement score is based on answers to the following four statements:

- I am proud to work at Arla.
- I intend to stay with Arla for at least the next 12 months.
- I would recommend Arla as a great place to work.
- My work gives me a sense of personal accomplishment.

Other encouraging feedback includes a high favourability score of 89% for diversity, inclusion and belonging – just six months after we strengthened our focus on this area. There was also a further small reduction – 0.2% – in experiences of unacceptable behaviour.

The chart shows the favourability scores in relation to the focus areas of our 2026 People Strategy, which aims to enable continuous healthy growth and secure an organisation fit for the future. New favourability target ranges will be established in 2023.

Category	2022 favourability score
Employee engagement	89%
Future vision	88%
Empowerment	88%
Overall leadership	86%
Work environment	90%
Well-being	85%
Diversity, inclusion & belonging	89%
Unacceptable behaviour	3.8%

## Impact

### On society

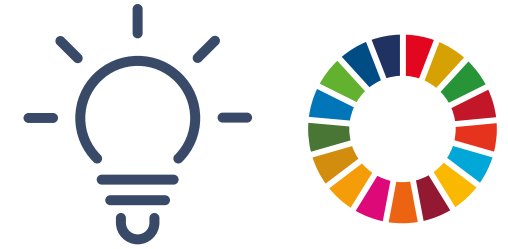
Through proactive efforts, we want to nurture an inclusive culture with equal opportunities for all, contributing to sustainable and prosperous societies and a good quality of life for people in the markets where we operate.

### On Arla Foods Ingredients

People are our most important resource. We strive to provide a positive working environment where colleagues thrive and grow, strengthening our ability to attract and retain colleagues and keep our business on the right track for the future.

### On Sustainable Development Goals





# ENERGY, WATER AND CLIMATE

## Ambition

Our climate ambition is aligned with the ambition of our parent company to reduce scope 1 and 2 carbon emissions by 63% by 2030, with 2015 as baseline. The Science-Based Targets Initiative (SBTi) has approved this level of reduction as a relevant contribution to the Paris Agreement target to limit global warming to 1.5°C.

The shift from fossil to renewable energy sources is a central element in achieving this ambition, along with initiatives to improve the efficiency of our production. Our greatest challenges in this respect are the increasingly advanced nature of our ingredient portfolio and business growth. This requires us to map and optimise our use of resources at each processing step.

## Priority actions

Our energy and water workstreams are driving activities to reduce our overall environmental footprint. Current carbon reduction initiatives are focused on reducing scope 1 and 2 emissions. The development of a new scope and ambition for our water workstream is high on our agenda in 2023, with a particular focus on data transparency.

Following a total plant assessment of Danmark Protein and ARINCO in 2022, we plan to implement many of the recommendations for water and energy optimisation in the coming year. We will also continue multi-site 'quick-win' improvements as part of the Arla supplier-driven assessments programme, which has identified three new focus areas for 2023.

At our production sites, the following major projects are underway or planned:

- **Danmark Protein**

Our 2030 utility master plan sets out the investments necessary for the transition to green technology and business growth. Major projects in 2023 include:

- Investment in a 15MW electric boiler in preparation for balancing the grid load
- Investment in a 90°C heat distribution system to utilise exhaust heat from the biogas motors. The system will be prepared for future connection to heat pumps. CO<sub>2</sub> emissions reduction target: 2,400 tonnes/year

- **AFISA**

A cleaning in place (CIP) optimisation project will enable recovery of nitric acid solution for reuse. Significant savings are expected on energy and cleaning agents.

- **ArNoCo**

Following the installation of a new CIP system in 2021, optimisation of plant cleaning procedures continues. Reducing the amount of wastewater and COD sent to the wastewater treatment plant is a primary focus. In 2023, ArNoCo will also pilot the use of ultrasound to improve the energy efficiency of the cleaning process in lactose production.

## Progress

### Carbon emissions

Our carbon emissions calculation covers the direct emissions (scope 1) and indirect emissions from purchased energy (scope 2) of our three fully-owned sites, which are those included in our climate ambition. The fully-owned sites are Danmark Protein, ARINCO and AFISA. In 2022, scope 1 and 2 emissions fell by 7.7% overall. This was due to energy optimisations at sites, a small reduction in powder production and the group-level purchase of renewable electricity certificates.

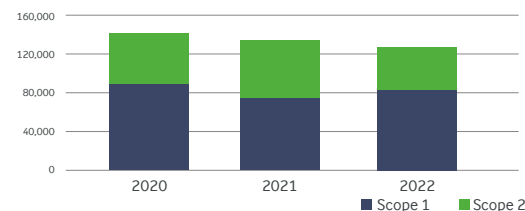
Due to the risk of a natural gas shortage, Danmark Protein converted partially to fuel oil – increasing scope 1 emissions. The negative CO<sub>2</sub> impact of this temporary shift to oil was balanced by the purchase of renewable energy certificates. This offsetting action reduced Danmark Protein's scope 2 emissions, leading to an overall reduction in scope 1 and 2 emissions of 7.4%.

At AFISA, scope 1 and 2 emissions fell by 8.6%, primarily due to the natural gas line commissioned in 2021 to reduce the plant's dependence on fuel oil.

Danmark Protein has finalised the installation of a 60°C system for redistributing surplus heat from its compressor stations. The system will save 632 tonnes of CO<sub>2</sub> a year. A 90°C heat system is also under construction to redistribute surplus heat from the plant's biogas motors as hot water. A potential 2,400 tonnes of CO<sub>2</sub> will be saved in the first phase.

MVI has undergone a full carbon assessment to highlight opportunities for improvement. Carbon optimisation initiatives in 2022 focused on heat recovery and insulation. As a joint venture site, MVI is not included in the carbon emission figures shown here.

### Annual scope 1 and 2 CO<sub>2</sub> emissions across all sites



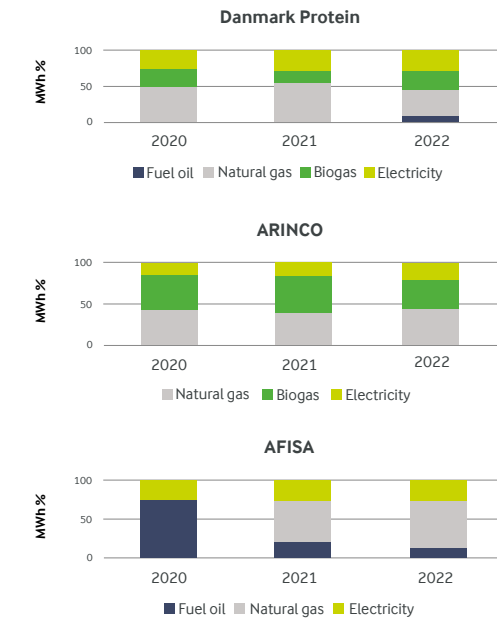
### Energy mix

The energy mix at our fully-owned sites impacts our CO<sub>2</sub> performance and ability to meet the climate goals.

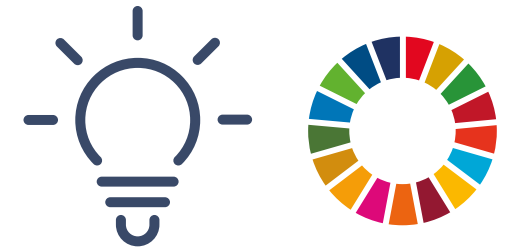
In Denmark, natural gas consumption fell by 22% overall due to the uncertain supply situation in Europe. Although biogas was able to replace some natural gas at Danmark Protein, fuel oil was reinstated as an energy source towards the end of the year.

In Argentina, AFISA continued the transition from fuel oil to natural gas following the completion of a new gas pipeline.

Electricity continues to account for around a quarter of the energy consumed across the three sites.



# ENERGY AND CLIMATE (CONTINUED)



## Progress (continued)

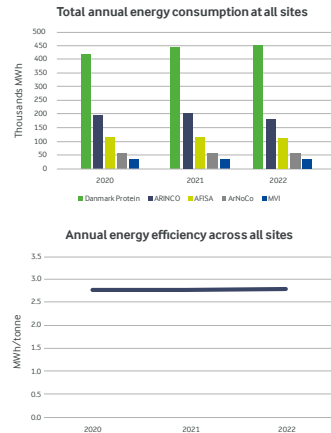
### Energy efficiency

The energy consumption of our fully-owned and joint venture production plants varies each year according to product mix and volumes. In 2022, powder production decreased by 4%, while energy consumption fell 2% compared to the previous year. Energy consumption per tonne of product increased by 2%.

Looking at our fully-owned sites alone, powder production went down by 6% and energy consumption fell 2% compared to the previous year. Energy consumption per tonne of product increased by 4%.

At Danmark Protein, ongoing investments to improve energy efficiency resulted in total natural gas savings of 5.52 GWh/year – equivalent to the average heating requirements of 305 households – and electricity savings of 2.1 GWh/year – equivalent to the average power requirements of 477 households.

Supplier-driven assessments have driven multi-site continuous improvements in LED lighting, pumps and insulation in 2022.



### Water efficiency

Total annual water consumption at our fully-owned and joint venture plants refers to water drawn from municipal water supplies and well water. In 2022, water consumption increased by 5%, also when looking at our fully-owned sites in isolation.

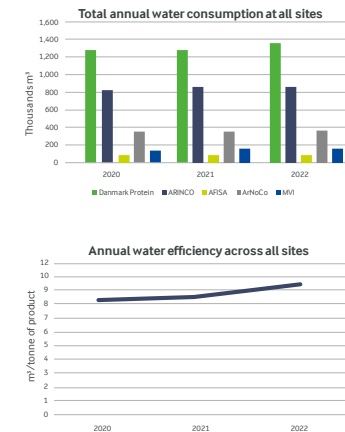
There are two primary explanations. Firstly, extra cleaning was necessary at ARINCO and Danmark Protein due to microbiological challenges. Secondly, there was a significant change in the whey pool at AFISA, where more raw materials are being delivered as pre-concentrate, with a high solids content, than thin whey. While this reduces tank truck deliveries – and thereby the climate impact of transport – this means less water is available from the raw material for reuse in the plant. Consequently, more well water is required.

In Denmark, our technical water facility for recycling wastewater supplied Danmark Protein with 500m<sup>3</sup> of technical water a day for non-food contact purposes through 2022. The next expansion up to 900m<sup>3</sup> a day is now being planned.

No water-saving projects were completed at Danmark Protein in 2022. However, new opportunities were mapped with potential to save around 1,000m<sup>3</sup> a day. An implementation plan is currently being developed.

AFISA has also established facilities for cleaning and reusing wastewater as technical water. The current capacity is 100m<sup>3</sup> a day.

At MVI, a new CIP set has been installed and is now fully functioning, using recycled water from the filtration process. This has reduced water consumption by around 10%.



## Impact

### On society

We recognise our responsibility to make the most of our whey-based raw materials, minimise waste and to limit our impact on the environment. Through our consumption of energy, water and other materials, we risk contributing to climate change and to depleting non-renewable resources.

### On Arla Foods Ingredients

Environmental changes that impact the supply and cost of raw materials, energy and clean water to our sites constitute a substantial business risk. Any failure on our side to address our potential impact on the environment and climate also represents a threat to our reputation.

### On Sustainable Development Goals



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Arla Foods Ingredients is a global leader in value-added whey solutions. We discover and deliver premium ingredients derived from whey, supporting the food industry with the development and efficient processing of natural, functional and nutritious foods.

Using our specialist knowledge of food products and production, we serve global manufacturers of early life nutrition, medical nutrition, sports nutrition, health foods and other food and beverage products.

Arla Foods Ingredients is a 100% owned subsidiary of the dairy company Arla Foods.

#### ABOUT THIS CORPORATE RESPONSIBILITY SUPPLEMENT

This supplement to the annual Arla Foods corporate responsibility report provides insights into relevant corporate responsibility matters specific to Arla Foods Ingredients.

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Discovering the wonders of whey 

